

Fishery Data Series No. 95-32

Southeast Alaska Recreational Cabin Survey, 1994

by

J. Douglas Jones

November 1995

Alaska Department of Fish and Game

Division of Sport Fish



Symbols and Abbreviations

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Weights and measures (metric)		General		Mathematics, statistics, fisheries	
centimeter	cm	All commonly accepted	e.g., Mr., Mrs.,	alternate hypothesis	H _A
deciliter	dL	abbreviations.	a.m., p.m., etc.	base of natural	e
gram	g	All commonly accepted	e.g., Dr., Ph.D.,	logarithm	
hectare	ha	professional titles.	R.N., etc.	catch per unit effort	CPUE
kilogram	kg	and	&	coefficient of variation	CV
kilometer	km	at	@	common test statistics	F, t, χ^2 , etc.
liter	L	Compass directions:		confidence interval	C.I.
meter	m	east	E	correlation coefficient	R (multiple)
metric ton	mt	north	N	correlation coefficient	r (simple)
milliliter	ml	south	S	covariance	cov
millimeter	mm	west	W	degree (angular or	°
		Copyright	©	degree (angular or	temperature)
		Corporate suffixes:		degrees of freedom	df
		Company	Co.	divided by	÷ or / (in
		Corporation	Corp.		equations)
		Incorporated	Inc.	equals	=
		Limited	Ltd.	expected value	E
		et alii (and other	et al.	fork length	FL
		people)		greater than	>
		et cetera (and so forth)	etc.	greater than or equal to	≥
		exempli gratia (for	e.g.,	harvest per unit effort	HPUE
		example)		less than	<
		id est (that is)	i.e.,	less than or equal to	≤
		latitude or longitude	lat. or long.	logarithm (natural)	ln
		monetary symbols	\$, ¢	logarithm (base 10)	log
		(U.S.)		logarithm (specify base)	log ₂ , etc.
		months (tables and	Jan,...,Dec	mideye-to-fork	MEF
		figures): first three		minute (angular)	'
		letters		multiplied by	x
		number (before a	# (e.g., #10)	not significant	NS
		number)		null hypothesis	H ₀
		pounds (after a number)	# (e.g., 10#)	percent	%
		registered trademark	®	probability	P
		trademark	™	probability of a type I	α
		United States	U.S.	error (rejection of the	
		(adjective)		null hypothesis when	
		United States of	USA	true)	
		America (noun)		probability of a type II	β
		U.S. state and District	use two-letter	error (acceptance of	
		of Columbia	abbreviations	the null hypothesis	
		abbreviations	(e.g., AK, DC)	when false)	
				second (angular)	"
				standard deviation	SD
				standard error	SE
				standard length	SL
				total length	TL
				variance	Var
Weights and measures (English)					
cubic feet per second	ft ³ /s				
foot	ft				
gallon	gal				
inch	in				
mile	mi				
ounce	oz				
pound	lb				
quart	qt				
yard	yd				
Spell out acre and ton.					
Time and temperature					
day	d				
degrees Celsius	°C				
degrees Fahrenheit	°F				
hour (spell out for 24-hour clock)	h				
minute	min				
second	s				
Spell out year, month, and week.					
Physics and chemistry					
all atomic symbols					
alternating current	AC				
ampere	A				
calorie	cal				
direct current	DC				
hertz	Hz				
horsepower	hp				
hydrogen ion activity	pH				
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

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by

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ABSTRACT

Postal surveys were sent in 1994 to parties reserving United States Forest Service (USFS) recreational cabins in Southeast Alaska. The purpose of the surveys was to estimate trout catches, harvest, and effort by users of USFS cabins at steelhead streams and cutthroat lakes. The survey targeted cutthroat trout *Oncorhynchus clarki* anglers in lakes. Of the 1,173 registered parties at USFS recreational cabins located on lakes, 459 responded to the survey. Of those who reported fishing for cutthroat, it is estimated that a total of 32,425 hours in 7,789 fishing days was needed to catch 19,323 cutthroat trout, 196 steelhead, 4,886 rainbow trout *Oncorhynchus mykiss*, 1,093 kokanee *Oncorhynchus nerka*, and 6,276 Dolly Varden *Salvelinus malma*. In the portion of the survey that targeted steelhead trout *Oncorhynchus mykiss*, 367 of the 718 registered parties responded and it is estimated that a total of 31,662 hours in 7,350 fishing days was spent to catch 4,476 steelhead, 4,726 rainbow trout, 8,427 cutthroat trout, 100 kokanee, and 6,584 Dolly Varden.

Key words: Harvest, catch, steelhead, cutthroat, rainbow, trout, kokanee, Dolly Varden, effort, angler, Southeast Alaska, recreation, cabin survey, creel census, mail survey.

INTRODUCTION

Harvests of cutthroat trout *Oncorhynchus clarki* in freshwater systems in Southeast Alaska are declining (1977–1993), and angler effort in fresh water is increasing (Figures 1 and 2) (Mills 1979–1994). Fewer large cutthroat trout in the most productive lakes are being harvested, based on entries to the Department of Fish and Game (ADF&G) Trophy Fish Program, suggesting that populations have declined. Regulations in effect in 1994 included a daily bag limit of two fish, and a possession limit of 1 daily bag limit. New minimum size restrictions were also in place for the first time in 1994: the basic regional size limits are a 12-inch minimum and a 22-inch maximum—a 14-inch minimum size is required in systems

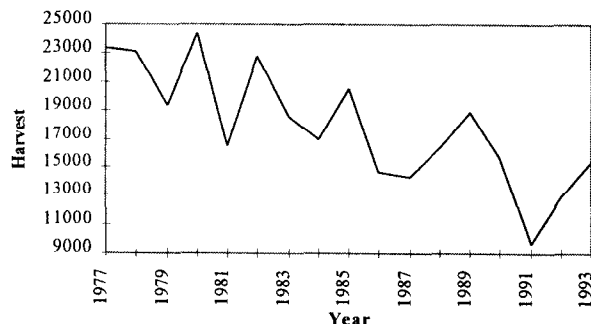


Figure 1.—Harvests of cutthroat trout in fresh water in Southeast Alaska, 1977–1993. (Data from Mills 1979–1994.)

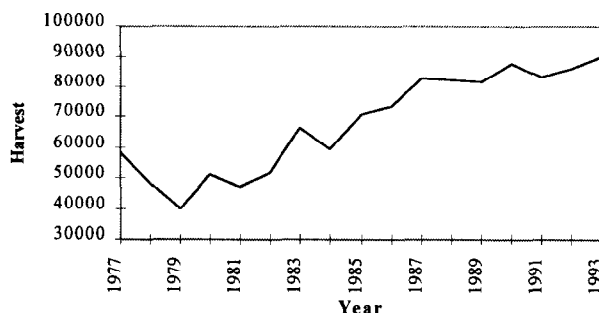


Figure 2.—Angler effort (days fished) in fresh water in Southeast Alaska, 1977–1993. (Data from Mills 1979–1994.)

classified as high-use, and a 25-inch minimum size is required in trophy cutthroat trout lakes.

Harvests of steelhead trout *Oncorhynchus mykiss* in Southeast Alaska increased from 1977 to 1989 but have declined by 75% since (Figure 3). There has been concern for populations of steelhead trout in Southeast Alaska because catch rates and escapements in some well-known streams have declined (Harding and Jones 1993). Regulations in effect in 1994 allowed a bag limit of one fish daily and two per season.

Factors contributing to the decline of cutthroat and steelhead populations include: (1) increased effort (Figure 2); (2) extreme susceptibility of cutthroat to fishing pressure (Behnke 1985); (3) increasing angler skill; (4) displacement of cutthroat trout by other stocked salmonid species,

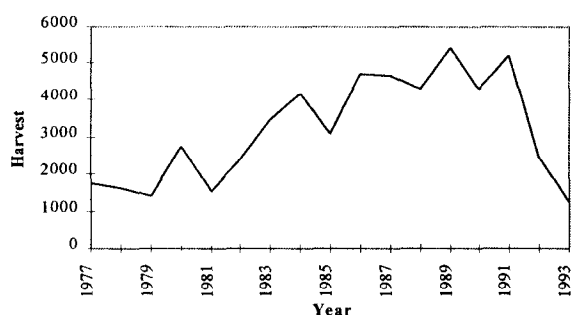


Figure 3.—Harvests of steelhead trout in Southeast Alaska, 1977–1993. (Data from Mills 1979–1994.)

owing to the vulnerability of cutthroat trout to displacement by many other species (Griffith 1988); (5) laddering of systems which allows other salmonid species into cutthroat habitat; and (6) land-use practices, such as logging, which increase access to streams with roads and alter the habitat important to cutthroat in and around the small streams (Meehan 1991, Trotter 1987).

The U. S. Forest Service (USFS) maintains recreational cabins on most of the important cutthroat trout lakes and steelhead streams in Southeast Alaska, and the number of visitor-days to USFS cabins has increased in the past 15 years. We believe that most angler effort for these species in systems with cabins originates from cabin users.

This study estimated angler effort, catch and harvest of all species of fish at USFS recreational cabins on steelhead trout streams and on cutthroat trout lakes in Southeast Alaska. Site-specific data on effort, catch, harvest, and release rates were needed to help identify potential problems in remote fisheries—a need identified in the Strategic Plans for Juneau, Sitka, and Ketchikan (Schwan 1990).

This survey information was to be used to help managers evaluate effects of regulations and to develop a regionwide management plan in late 1993. The information from this survey was to formulate a management plan for both steelhead and cutthroat trout in 1993, which resulted in extensive regulatory changes by the Board of

Fisheries in January of 1994. In future years, information from this survey will be used to evaluate the effect of those regulatory changes on the fisheries.

The objectives for 1994 were:

1. to estimate angler effort, catch, and harvest of steelhead trout, cutthroat trout, rainbow trout *Oncorhynchus mykiss*, kokanee *Oncorhynchus nerka*, and Dolly Varden *Salvelinus malma* by stream for parties registered to use USFS cabins on steelhead streams in Southeast Alaska.
2. to estimate angler effort, catch, and harvest of cutthroat trout, rainbow trout, kokanee, and Dolly Varden by lake for parties registered to use USFS cabins on selected lakes in Southeast Alaska.
3. to estimate the proportion of days fished by parties registered to use selected USFS cabins where cutthroat trout harvests were limited because a bag or possession limit was reached.

METHODS

A postal survey was used to estimate angler effort, catch, and harvests by registered users of 85 individual USFS cabins in 1994. Names of USFS cabin users were obtained from cabin reservation lists from each USFS ranger district in Southeast Alaska.

Estimates of angler effort, catch, harvest, and the proportion of fishing days limited by bag and possession limits were conducted on cutthroat lakes with USFS recreational cabins (Table 1). Questionnaires were sent to parties registered to use each of the selected cabins from January 1 through December 31, 1994.

Angler effort, catch and harvest of steelhead trout at cabins on steelhead river systems (Table 2) was censused by sending questionnaires to parties registered to use each of the cabins from January 1 through December 31, 1994.

Table 1.—Number of registered parties, responding parties, and total estimated effort (days and hours fished), and fish kept and released by species for cutthroat trout systems surveyed in Southeast Alaska in 1994.

System	Lost ¹	Regis-	Respond-	Days	Hours	Cutthroat		Steelhead		Rainbow		Kokanee		Dolly Varden	
		tered	ing			Kept	Released	Kept	Released	Kept	Released	Kept	Released	Kept	Released
Bakewell Lake		22	15	310	1,669	84	570	0	0	0	147	0	1	3	16
Baranof Lake		16	7	126	537	151	441	0	0	5	400	0	0	0	0
Control Lake	Y	25	5	200	320	80	350	0	0	0	0	0	0	50	165
Distin Lake	Y	29	12	203	636	41	393	0	0	58	182	0	0	2	22
Eagle Lake	Y	9	4	18	72	0	14	0	0	0	0	0	0	0	23
Ella Lake	Y	35	16	355	1,508	70	584	2	0	88	171	2	0	9	28
Essowah Lake		3	2	44	258	0	30	0	0	0	0	0	0	0	0
Florence Lake	Y	27	12	232	803	326	1,082	0	0	41	16	7	0	2	106
Goulding Lake	Y	11	2	248	831	105	182	0	0	28	110	0	0	0	0
Hasselborg Lake		69	34	575	2,498	140	1,614	0	0	12	131	2	29	8	17
Heckman Lake	Y	31	19	322	1,996	21	170	0	13	58	578	0	0	10	318
Honker Lake	Y	14	8	93	485	86	267	0	0	0	0	2	0	0	0
Humpback Lake		21	14	233	1,190	51	980	0	0	0	6	0	0	8	87
Jims Lake	Y	33	16	306	1,060	40	583	0	0	0	6	0	10	0	0
Jordan Lake		45	24	391	2,230	52	336	0	70	48	641	0	0	35	332
Lake Alexander	Y	25	12	188	772	138	906	0	0	10	14	0	0	6	6
Lake Eva		39	22	413	1,726	109	363	2	17	24	201	47	145	140	1,977
Lake Kathleen		17	2	45	73	0	0	0	0	0	0	0	0	22	99
Manzanita Lake	Y	37	23	292	1,506	106	753	2	0	122	201	76	251	8	380
Orchard Lake		13	5	136	669	46	372	0	0	0	0	0	0	3	28
Patching Lake	Y	18	12	91	271	31	486	0	2	14	11	0	0	14	115
Peterson Lake	Y	135	31	325	667	230	264	0	4	0	4	0	0	0	36
Rainbow Lake	Y	4	3	27	123	3	8	0	0	11	63	0	0	0	0
Salmon Lake		49	1	196	1,078	343	588	0	0	0	0	0	0	0	0
Salt Chuck East	Y	13	4	75	348	13	169	0	0	0	0	0	0	13	78
Stikine River		172	29	673	1,652	101	732	5	0	175	976	0	0	10	715
Sweetwater Lake		56	24	332	1,791	132	157	0	72	6	35	0	0	110	117
Taku River	Y	9	5	23	40	7	14	0	0	2	0	0	0	0	0
Turner Lake		70	35	425	1,798	74	843	2	0	14	17	157	129	165	336
Virginia Lake	Y	25	12	120	660	45	399	0	0	40	40	0	0	0	145
Wilson Lake		24	11	341	1,681	58	2,165	0	5	19	64	29	165	59	359
Winstanley Lake		14	9	73	431	58	264	0	0	8	26	0	9	0	12
Young Lake		63	29	358	1,046	44	459	0	0	6	57	6	26	21	61
Total		1,173	459	7,789	32,425	2,785	16,538	13	183	789	4,097	328	765	698	5,578

¹Lost (Y) indicates that the seasonal* system estimates were lost due to nonresponses, and the reported totals are biased low as a result.

Table 2.—Number of registered parties, responding parties, and total estimated effort (days and hours fished), and fish kept and released by species for USFS cabins on steelhead streams in Southeast Alaska in 1994.

System	pBias ¹	Regis- tered	Respond- ing	Days	Hours	Cutthroat		Steelhead		Rainbow		Kokanee		Dolly Varden	
						Kept	Released	Kept	Released	Kept	Released	Kept	Released	Kept	Released
Admiralty Cove	0	59	20	501	1,467	0	2	32	23	34	8	0	0	282	163
Anan Bay	0	25	7	210	842	0	325	0	0	0	43	0	0	20	157
Castle River	0	43	29	341	1,259	0	1	268	1,399	14	93	0	0	92	367
Fish Creek	0	60	23	517	1,771	0	56	314	1,868	54	410	5	5	15	68
Harding River	0	14	9	170	880	0	17	2	0	6	20	0	0	256	204
Hugh Smith Lake	0	9	5	73	380	0	0	12	255	6	80	0	0	18	162
Italio River	1	8	6	171	899	9	21	17	49	0	0	0	0	85	7
Kadake Bay	1	24	10	246	1,123	14	289	128	994	0	8	11	11	126	267
Kah Sheets Lake	1	55	24	270	932	3	229	45	274	0	7	0	15	166	136
Karta River	4	75	54	1,358	5,798	62	103	434	995	106	648	6	6	185	512
Kegan Creek	1	33	23	456	1,801	34	302	102	182	147	650	0	0	1	1
Kook Lake	1	14	9	104	303	201	269	0	0	2	25	0	0	24	77
McDonald Lake	0	28	17	435	2,151	0	237	48	456	70	1,422	0	6	70	696
Red Bay Lake	0	15	7	77	150	0	0	0	0	0	0	0	0	0	2
Reflection Lake	0	26	8	173	836	27	132	0	0	85	9	0	0	0	3
Salmon Bay Lake	2	9	4	101	380	16	437	0	5	2	23	0	0	14	7
Sarkar Lake	1	45	22	237	923	51	387	0	0	16	36	0	0	10	39
Sitkoh Lake	1	35	10	312	1,156	3	52	45	172	38	424	0	0	46	264
Situk River	1	84	59	1,142	7,071	36	1,158	90	149	108	129	31	4	623	1,335
Staney Creek	2	57	21	456	1,540	0	3	33	36	1	2	0	0	27	57
Total		718	367	7,350	31,662	456	4,020	1,570	6,857	689	4,037	53	47	2,060	4,524

¹ pBias = number of cabins in the system lost due to nonresponse: pBias>0 implies the totals are biased low.

Each registered 'party head' was sent a two-page questionnaire with a cover letter (Appendix B). The first page of the questionnaire asks the party head if the reservation was used, the number of members in the group, if any members of the party fished, and how they would rate the fishing if they fished.

The second page of the questionnaire asks about the number of days and hours party members fished, the numbers of steelhead, cutthroat trout, rainbow trout, kokanee, and Dolly Varden caught and kept, and the numbers of each species caught and released, by angler (this page was slightly different for the two surveys). The second page sent to users of cabins on cutthroat trout lakes also asks anglers questions about current cutthroat trout restrictions and about catches of cutthroat trout above and below the legal size limit. Information on bag or possession limits from steelhead anglers was not requested, as the bag limit was one fish per day. For these anglers, the proportion of days fished with a catch or harvest (angler success) was more informative. Also, anglers in these systems were not asked about harvests of large and small cutthroat trout.

Reservation lists were obtained from the USFS after May 31, October 31, and December 31, 1994. Mailings to 'party heads' in each list were conducted separately; e.g., all anglers scheduled to have completed the use of a cabin between January 1 and May 31 were sent surveys as if they represented a unique population. The survey thus had seasonal stratification. Response data for each stratum were processed independently of data in other strata.

Within each stratum, three mailings were conducted. The first mailing was sent to all party heads. If a response was not received within three weeks, a second mailing was sent. If after an additional 3 weeks a response was not received, a final mailing was sent.

In each temporal stratum, total reported harvest H_r at each cabin (for the steelhead survey) or lake (for the cutthroat survey) was the sum over mailings $m = 1..3$:

$$H_r = \sum_{m=1}^3 H_{r,m} \quad (1)$$

Since response was not 100%, means, medians, and histograms of harvest per responding party for each mailing were made, to decide if response to each mailing was similar. Comparisons between and across cabins were used to help identify trends in reported harvest per responding party by mailing. Since responses to each mailing at a cabin were similar, total harvest H at the cabin (for the steelhead survey) or lake (for the cutthroat survey) was calculated:

$$H = \left(\frac{N}{N_r} \right) H_r \quad (2)$$

where N_r = number of responding parties and N = number of parties on the USFS reservation list. Calculation of total effort E and total catch C at each cabin or lake by species was as above after substituting the appropriate variable for H .

Occasionally, items were missing in a response received from a party head. A party head, for example, listed catch but not effort, or listed effort but not catch. Because this occurred at a very low rate in this survey (all were less than 3%), no adjustments or estimates for missing data items were made.

Variances for estimated totals were computed using the formula for simple random sampling (Cochran 1977):

$$V[H] = \left(1 - \frac{N_r}{N}\right) N^2 \frac{\sum_{i=1}^{N_r} (H_r - \bar{H}_r)^2}{N_r (N_r - 1)} \quad (3)$$

which was justified by the finding of no significant differences in mean response per party by mailing.

Effort, catch, and harvest for each cutthroat trout lake (Table 1) or steelhead stream (Table 2), and their variances (Appendices A1 and A2), were obtained by summing point estimates for individual cabins or systems over surveys or seasons.

The proportion of days that bag or possession limits for cutthroat trout were restricted was included to provide an indication of the effect of current and proposed management regulations at these fishing areas. The proportion was estimated:

$$p_r = \frac{D_r}{D} \quad (4)$$

where D_r = number of days in which respondents report angling was restricted by a bag or possession limit, and D = number of days of angling reported.

RESULTS

There were no apparent trends in the average harvest per responding party (Appendix A3) in any of the three mailings for steelhead or cutthroat trout. As a result, direct expansions (Equation 2) were used to calculate total effort, catch, and harvest (Tables 1 and 2).

Anglers spent an estimated 32,425 hours spread over 7,789 fishing days to harvest 2,785 cutthroat trout, 13 steelhead, 789 rainbow trout, 328 kokanee, and 698 Dolly Varden from the cutthroat lakes surveyed in 1994 (Table 1). Anglers also caught and released another 16,538 cutthroat trout, 183 steelhead, 4,097 rainbow trout, 765 kokanee, and 5,578 Dolly Varden in these lake systems.

In the steelhead streams with USFS cabins, anglers spent an estimated 31,662 hours spread over 7,350 days to harvest 456 steelhead trout, 689 rainbow trout, 1,570 cutthroat trout, 53 kokanee, and 2,060 Dolly Varden in 1994 (Table 2). Anglers also reported catching and releasing another 4,020 steelhead, 4,037 rainbow trout, 6,857 cutthroat trout, 47 kokanee, and 4,524 Dolly Varden from these systems.

In total, 4,355 cutthroat trout, 469 steelhead trout, 1,478 rainbow trout, 381 kokanee, and 2,758 Dolly Varden were harvested in 64,087 hours of effort spread over 15,139 days in the systems with USFS cabins included in this survey. An additional 23,395 cutthroat trout, 4,203 steelhead, 8,134 rainbow trout, 812 kokanee, and 10,102 Dolly Varden were caught and released.

Table 3.—Summary of how parties rated cutthroat trout fishing from the cabins they visited during 1994.

System	Excellent	Good	Fair	Poor
Bakewell Lake	3	4	6	0
Baranof Lake	3	3	1	0
Distin Lake	0	3	5	3
Eagle Lake	0	1	2	0
Ella Lake	1	5	5	4
Essowah Lake	0	1	0	1
Florence Lake	3	4	1	2
Goulding Lake	0	1	0	1
Hasselborg Lake	2	10	9	12
Heckman Lake	0	2	6	11
Honker Lake	1	0	3	4
Humpback Lake	3	4	5	2
Jims Lake	2	3	7	3
Jordan Lake	1	3	4	8
Lake Alexander	1	4	3	4
Lake Eva	4	3	7	6
Lake Kathleen	0	0	0	2
Manzanita Lake	2	6	7	7
Orchard Lake	0	4	1	0
Patching Lake	2	0	3	6
Peterson Lake	1	3	5	19
Rainbow Lake	0	0	0	1
Salmon Lake	0	1	0	0
Salt Chuck East	0	1	0	2
Stikine River	5	3	3	7
Sweetwater Lake	1	1	5	11
Taku River	0	0	2	0
Turner Lake	3	9	11	8
Virginia Lake	3	2	2	3
Wilson Lake	3	4	1	2
Winstanley Lakes	1	1	6	1
Young Lake	1	5	4	17
Total	71	144	181	259

Respondents to the cutthroat trout survey were asked how many days their fishing was limited by the current bag and possession limits. In 1994, anglers reported that their harvest was restricted by bag limits on only 17% of the total days fished.

Party heads rated fishing for cutthroat trout at the cabin they visited from excellent to poor (Table 3). Cabins at Lake Kathleen, and Rainbow Lake received only poor ratings for cutthroat fishing,

while Baranof Lake received primarily good to excellent ratings.

In the steelhead survey, 50% of the anglers reported catching a steelhead during the period from January through May. For the whole year, 15% of the anglers reported catching a steelhead, but few steelhead remain in streams in Southeast Alaska after May so most effort is for other species.

Over 60% of the respondents to the survey used their cabin reservation in 1994. Eight hundred twenty-three (823) of the respondents who used their reservations (68%) reported that they fished at some time during their stay. The average party size was 2.7 people (Appendices A3 and A4), and the range of size was 1–18 people per party.

Of the parties reserving cabins, 1,403 (70%) originated from within Alaska, and the remaining parties (598) originated from outside of Alaska. Four hundred fifty-three (453) of the out-of-state parties (76%) used their cabin reservation, and 757 of the parties originating from Alaska (54%) used their reservations.

DISCUSSION

Angler success for steelhead was comparable to results reported in 1992 and 1993. In 1992, 56% of anglers responding caught a steelhead during the spring season, compared to 46% in 1993 and 50% in 1994. For the year, 15% reported catching a steelhead in 1994, compared to 14% in 1993 and 26% in 1992.

Some USFS recreational cabins were much more popular than others (Appendices A3 and A4). Peterson Lake cabin near Juneau had the greatest number of registered parties (149) in a season, of all cabins surveyed. Stanley Creek on Prince of Wales Island and Fish Creek near Ketchikan had 64 and 60 reservations, respectively, and were also at the top of the list of more popular cabins.

Anglers fishing at USFS cabins located at cutthroat trout lakes in 1994 reported being limited by harvest regulations (bag and possession limits) on 17% of the days they fished

compared to 24% in 1992 (Jones 1993) and 7% in 1993 (Jones 1994). In comparing total angler ratings for cutthroat trout fishing in 1994, most (67.1%) rated the fishing only fair to poor, and only 11% rated the fishing excellent (Table 3). If the fishing were better, the ratio of anglers being limited by harvest regulations could be expected to rise.

Release rates for all species surveyed were high again in 1994 and very comparable to release rates reported in 1992 and 1993. In total, release rates for cutthroat trout (for both surveys combined) were 84% in 1994, 85% in 1993, and 83% in 1992.

For steelhead, release rates dropped from 95% in 1992 to 87% in 1993 but rose in 1994 to 90%.

ACKNOWLEDGMENTS

I would like to thank Kurt Kondzela, who did most of the data entry for this project, for his help, suggestions and time. His efforts were very much appreciated.

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APPENDIX A

Appendix A1.—Standard errors of estimates by system for effort (days and hours fished), and fish kept and released by species for selected cutthroat trout systems in Southeast Alaska in 1994.

System	VBias	Days	Hours	Cutthroat		Steelhead		Rainbow		Kokanee		Dolly Varden	
				Kept	Released	Kept	Released	Kept	Released	Kept	Released	Kept	Released
Bakewell Lake	0	49	290	20	88	0	0	0	86	0	0	2	5
Baranof Lake	0	23	140	35	198	0	0	3	300	0	0	0	0
Control Lake	0	85	200	72	302	0	0	0	0	0	0	45	148
Distin Lake	0	32	165	26	122	0	0	44	94	0	0	2	16
Eagle Lake	0	13	54	0	10	0	0	0	0	0	0	0	17
Ella Lake	0	41	314	19	204	2	0	36	82	2	0	5	16
Essowah Lake	0	10	128	0	17	0	0	0	0	0	0	0	0
Florence Lake	0	39	189	103	430	0	0	22	9	5	0	2	79
Goulding Lake	0	55	443	95	114	0	0	25	99	0	0	0	0
Hasselborg Lake	0	70	451	34	404	0	0	9	76	1	15	6	9
Heckman Lake	0	21	285	4	28	0	4	14	109	0	0	6	201
Honker Lake	0	18	96	25	82	0	0	0	0	1	0	0	0
Humpback Lake	0	22	120	19	188	0	0	0	3	0	0	4	40
Jims Lake	1	38	175	22	119	0	0	0	4	0	7	0	0
Jordan Lake	1	34	247	19	65	0	14	12	150	0	0	9	65
Lake Alexander	1	28	174	48	254	0	0	6	10	0	0	3	3
Lake Eva	1	38	260	26	56	1	7	9	72	29	86	33	314
Lake Kathleen	2	—	—	—	—	—	—	—	—	—	—	—	—
Manzanita Lake	0	25	197	24	145	1	0	49	72	24	89	5	207
Orchard Lake	1	22	276	25	29	0	0	0	0	0	0	2	22
Patching Lake	0	14	50	7	140	0	1	8	5	0	0	8	60
Peterson Lake	0	50	129	214	101	0	3	0	3	0	0	0	25
Rainbow Lake	0	4	10	1	4	0	0	5	17	0	0	0	0
Salmon Lake	1	—	—	—	—	—	—	—	—	—	—	—	—
Salt Chuck East	0	28	135	8	141	0	0	0	0	0	0	11	65
Stikine River	2	129	283	70	240	5	0	45	14	0	0	9	151
Sweetwater Lake	1	71	467	74	65	0	54	3	15	0	0	74	68
Taku River	0	9	13	3	8	0	0	1	0	0	0	0	0
Turner Lake	0	47	366	26	125	1	0	6	6	50	43	62	81
Virginia Lake	1	23	116	17	82	0	0	0	0	0	0	0	98
Wilson Lake	0	44	320	15	1,323	0	0	10	41	10	52	28	158
Winstanley Lake	0	19	180	15	66	0	0	5	12	0	6	0	7
Young Lake	0	58	243	19	77	0	0	5	33	5	20	15	27

¹ If vbias > 0 then the standard error estimate is biased low (or undefined) due to inadequate responses to the survey.

Appendix A2.—Standard errors of estimates by system for effort (days and hours fished), and fish kept and released by species for steelhead systems in Southeast Alaska in 1994.

System	VBias	Days	Hours	Steelhead		Cutthroat		Rainbow		Kokanee		Dolly Varden	
				Kept	Released	Kept	Released	Kept	Released	Kept	Released	Kept	Released
Admiralty Cove	2	54	270	0	2	18	10	25	6	0	0	14	56
Anan Bay	1	22	74	0	0	0	0	0	36	0	0	0	6
Castle River	1	33	151	0	1	50	291	4	23	0	0	23	70
Fish Creek	0	122	399	0	16	165	1,027	34	272	3	3	7	27
Harding River	0	34	244	0	10	1	0	3	9	0	0	137	98
Hugh Smith Lake	0	4	49	0	0	4	73	3	43	0	0	11	63
Italio River	0	21	132	5	11	5	14	0	0	0	0	43	3
Kadake Bay	0	53	232	11	222	23	136	0	7	8	8	39	99
Kah Sheets Lake	0	27	160	2	62	10	50	0	6	0	12	64	51
Karta River	0	86	331	31	21	210	213	34	166	3	3	81	102
Kegan Creek	0	48	244	10	100	36	41	43	232	0	0	1	1
Kook Lake	0	20	80	102	89	0	0	1	15	0	0	8	43
McDonald Lake	0	29	228	0	59	19	104	17	369	0	3	26	253
Red Bay Lake	0	8	24	0	0	0	0	0	0	0	0	0	2
Reflection Lake	1	24	103	10	73	0	0	0	7	0	0	0	2
Salmon Bay Lake	0	30	113	5	220	0	3	2	17	0	0	10	5
Sarkar Lake	0	30	159	14	105	0	0	10	20	0	0	4	29
Sitkoh Lake	1	51	124	0	0	26	80	26	219	0	0	26	80
Situk River	1	51	491	16	156	66	73	54	36	10	1	136	187
Staney Creek	0	82	364	0	1	24	18	1	2	0	0	17	35

¹ vBias = number of cabins without variance estimates; if vBias>0 the standard error is biased low (or missing).

Appendix A3.—Sum and average of hours fished, harvest, and numbers released per responding party, for cutthroat trout and steelhead trout recreational surveys, by survey strata and mailing, 1994.

CUTTHROAT SURVEY							
Survey	Response	Sum of data			Mean of data		
		Hours	Kept	Released	Hours	Kept	Released
Spring	1	1227.0	67	632	12.4	1	6
	2	191.0	1	120	9.6	0	6
	3	151.0	5	97	13.7	0	9
Summer	1	10665.0	923	10515	13.4	1	13
	2	3085.0	299	2084	13.8	1	9
	3	1572.0	98	1798	14.3	1	16
Fall	1	108.3	5	19	4.9	0	1
	2	9.0	0	42	2.3	-	11
Total		17008.3	1398	15307	13.2	1	12

STEELHEAD SURVEY							
Survey	Response	Sum of data			Mean of data		
		Hours	Kept	Released	Hours	Kept	Released
Spring	1	2602.0	49	796	20.8	4	13
	2	944.0	-	323	24.2		13
	3	296.0	2	20	15.6	1	2
Summer	1	9439.5	8	36	19.5	1	3
	2	1921.0	21	14	16.4	5	2
	3	955.0	-	29	21.2		6
Fall	1	322.0	-	59	26.8		7
	2	119.0	-	80	11.9		27
Total		16598.5	80	1,357	19.5	3	10

Appendix A4.-Summary of the number of reservations and average party size by seasonal strata for the cutthroat trout mailout survey.

SPRING SURVEY			
System	Cabin name	No. of Parties	Mean party size
Bakewell Lake	Bakewell Lake	3	1
Control Lake	Control Lake	4	0
Distin Lake	Sportsmen	1	0
Eagle Lake	Eagle Lake	2	2
Ella Lake	Ella Narrows	1	0
	Red Alders	1	0
Goulding Lake	Goulding Lake	1	1
Hasselborg Lake	Big Shaheen	1	6
	Hasselborg Creek	2	2
	Little Shaheen	2	1
Heckman Lake	Heckman Lake	13	2
Honker Lake	Honker Lake	5	5
Humpback Lake	Humpback Lake	3	3
Jims Lake	Jims Lake	1	0
Jordan Lake	Jordan Lake	15	2
Kah Sheets Lake	Kah Sheets Lake	7	2
Kegan Creek	Kegan Creek	4	3
Kook Lake	Kook Lake	1	0
Lake Alexander	Lake Alexander	3	1
Lake Eva	Lake Eva	4	1
Manzanita Lake	Beaver Camp	1	0
	Manzanita Lake	3	1
Orchard Lake	Plenty Cutthroat	2	1
Patching Lake	Patching Lake	5	3
Peterson Lake	Peterson Lake	46	3
Rainbow Lake	Rainbow Lake	1	0
Red Bay Lake	Red Bay Lake	2	0
Reflection Lake	Reflection Lake	5	2
Salmon Bay Lake	Salmon Bay Lake	3	2
Salmon Lake	Salmon Lake-Sitka	49	6
Salt Chuck East	Salt Chuck East	9	2
Sarkar Lake	Sarkar Lake	14	3
Stikine River	Granet Ledge	10	4
	Koknuk	1	1
	Little Dry Island	4	1
	Mount Flemer	5	5
	Mount Rynda	2	2
	Shakes Slough #1	5	0
	Shakes Slough #2	3	2
	Twin Lakes	1	0
Sweetwater Lake	Sweetwater Lake	18	3
Taku River	Spruce Camp	3	1
Turner Lake	East Turner	3	3
	West Turner	3	3
Virginia Lake	Virginia Lake	5	2
Wilson Lake	Wilson View	1	4
SUMMER SURVEY			
Bakewell Lake	Bakewell Lake	19	2
Baranof Lake	Baranof Lake	16	2
Control Lake	Control Lake	25	3

SUMMER SURVEY (continued)			
System	Cabin name	No. of Parties	Mean party size
DeBoer Lake	DeBoer Lake	1	0
Distin Lake	Distin Lake	10	2
	Sportsmen	14	3
Eagle Lake	Eagle Lake	9	2
Ella Lake	Ella Narrows	22	2
	Red Alders	13	3
Essowah Lake	Essowah Lake	3	3
Florence Lake	East Florence	15	3
	West Florence	12	3
Goulding Lake	Goulding Lake	11	5
Hasselborg Lake	Big Shaheen	25	4
	Hasselborg Creek	15	1
	Little Shaheen	24	2
Heckman Lake	Heckman Lake	18	2
Honker Lake	Honker Lake	9	1
Humpback Lake	Humpback Lake	18	2
Jims Lake	Jims Lake	30	2
Jordan Lake	Jordan Lake	26	2
Kah Sheets Lake	Kah Sheets Lake	18	3
Kegan Creek	Kegan Creek	11	3
Kook Lake	Kook Lake	11	3
Lake Alexander	Lake Alexander	22	2
Lake Eva	Lake Eva	31	3
Lake Kathleen	Lake Kathleen	11	2
Manzanita Lake	Beaver Camp	15	2
	Manzanita Lake	22	2
Orchard Lake	Plenty Cutthroat	11	2
Patching Lake	Patching Lake	13	2
Peterson Lake	Peterson Lake	89	2
Rainbow Lake	Rainbow Lake	4	2
Red Bay Lake	Red Bay Lake	15	2
Reflection Lake	Reflection Lake	21	2
Salmon Bay Lake	Salmon Bay Lake	9	3
Salt Chuck East	Salt Chuck East	13	2
Sarkar Lake	Sarkar Lake	31	3
Sitkoh Lake	Sitkoh Lake	1	12
Stikine River	Binkley Slough	2	1
	Granet Ledge	20	4
	Gut Island #1	6	4
	Koknuk	5	2
	Little Dry Island	10	2
	Mount Flemer	8	3
	Mount Rynda	18	3
	Sergief Island	4	2
	Shakes Slough #1	21	4
	Shakes Slough #2	22	4
	Twin Lakes	21	4
Turner Lake	East Turner	27	3
	West Turner	37	3
Virginia Lake	Virginia Lake	20	1

-continued-

Appendix A4. Page 2 of 2.

SUMMER SURVEY (continued)			
System	Cabin name	No. of Parties	Mean party size
Wilson Lake	Wilson Narrows	7	2
	Wilson View	16	1
Winstanley Lakes	Winstanley Lakes	14	3
Young Lake	North Young Lake	28	2
FALL SURVEY			
System	Cabin name	No. of Parties	Mean party size
	South Young Lake	29	2
Control Lake	Control Lake	7	3
Distin Lake	Distin Lake	1	0
	Sportsmen	4	3
Florence Lake	East Florence	4	2
	West Florence	5	3
Hasselborg Lake	Big Shaheen	4	3
	Hasselborg Creek	1	0
	Little Shaheen	1	3
Heckman Lake	Heckman Lake	1	0
Honker Lake	Honker Lake	1	0
Jims Lake	Jims Lake	3	2
Jordan Lake	Jordan Lake	4	5
Kook Lake	Kook Lake	3	4
Lake Alexander	Lake Alexander	3	3
Lake Eva	Lake Eva	4	3
Lake Kathleen	Lake Kathleen	6	3
Patching Lake	Patching Lake	1	0
Peterson Lake	Peterson Lake	14	2
Salmon Bay Lake	Salmon Bay Lake	1	3
Salt Chuck East	Salt Chuck East	3	4
Sarkar Lake	Sarkar Lake	1	0
Stikine River	Binkley Slough	1	4
	Gut Island #1	3	1
Sweetwater Lake	Sweetwater Lake	5	1
Virginia Lake	Virginia Lake	1	0
Young Lake	North Young Lake	4	3
	South Young Lake	2	0

Appendix A5.—Summary of the number of reservations and average party size by seasonal strata for the steelhead mailout survey.

SPRING SURVEY			
System	Cabin name	No. of Parties	Mean party size
Admiralty Cove		10	1
Anan Bay	Anan Bay	5	2
Castle River	Castle Flats	4	3
	Castle River	9	3
East Sitkoh Lake	East Sitkoh Lake	4	3
Fish Creek	Fish Creek	23	3
Harding River	Harding River	3	3
Hugh Smith Lake	Hugh Smith Lake	1	3
Italio River	Italio River	3	1
Kadake Bay	Kadake Bay	11	2
Kah Sheets Lake	Kah Sheets Bay	7	0
Karta River	Karta Lake	10	2
	Karta River	10	3
	McGilvery Creek	1	1
Kegan Creek	Kegan Cove	4	4
McDonald Lake	McDonald Lake	9	2
Situk River	Middle Situk R.	6	2
	North		
	Middle Situk R.	5	4
	South		
	Situk Lake	1	3
	Situk Weir	5	3
Staney Creek	Shipley Bay	1	0
	Staney Creek	16	5
West Sitkoh Lake	West Sitkoh Lake	1	0

SUMMER SURVEY			
Admiralty Cove		38	3
Anan Bay	Anan Bay	20	2
Castle River	Castle Flats	11	2
	Castle River	18	4
Fish Creek	Fish Creek	32	3
Harding River	Harding River	11	4
Hugh Smith Lake	Hugh Smith Lake	8	1
Italio River	Italio River	8	4
Kadake Bay	Kadake Bay	13	2
Kah Sheets Lake	Kah Sheets Bay	23	2
Karta River	Karta Lake	19	3
	Karta River	18	3
	McGilvery Creek	9	3
	Salmon Lake—Karta	8	2
Kegan Creek	Kegan Cove	14	4
McDonald Lake	McDonald Lake	19	3
Sitkoh Lake	East Sitkoh Lake	16	3
	West Sitkoh Lake	14	2
Situk River	Middle Situk R.	14	2
	North		
	Middle Situk R.	15	3
	South		

SUMMER SURVEY (continued)			
System	Cabin name	No. of Parties	Mean party size
Staney Creek	Shipley Bay	4	2
	Staney Creek	37	3
FALL SURVEY			
Admiralty Cove		11	3
Castle River	Castle River	1	3
Fish Creek	Fish Creek	5	2
Kadake Bay	Kadake Bay	1	4
Kah Sheets Lake	Kah Sheets Bay	1	1
Karta River	Karta Lake	1	0
	Karta River	3	0
	McGilvery Creek	1	3
	Salmon Lake	1	0
Kegan Creek	Kegan Cove	1	2
Sitkoh Lake	West Sitkoh Lake	2	2
Situk River	Middle Situk R.	2	2
	North		
	Middle Situk R.	3	3
	South		
Staney Creek	Staney Creek	11	1

Appendix A6.—Data files used in preparation of this report.

1994.xls	Excel spreadsheet with raw data
ct_pty_2.xls	Excel spreadsheet with cutthroat data by party
sh_pty94.xls	Excel spreadsheet with steelhead data by party
ctvars.sas	SAS program for summarizing cutthroat data
shvars.sas	SAS program for summarizing steelhead data

APPENDIX B
QUESTIONNAIRE

**Alaska Department of Fish &
Game
Recreational Cabin Survey**

Dear Mr/Mrs ??????;

The Alaska Department of Fish and Game, the Division of Sport Fish is currently studying fish in «System».

Because you reserved a cabin at «System», we are asking for your assistance. Information about any fishing you or anyone with you (your party) may have done while using that reservation is important to our study. Please complete the attached form to the best of your ability, then return the form in the enclosed addressed and stamped envelope. Your responses will remain strictly confidential; only the summary of information from all respondents will be published. If you wish a copy of the summary, please specify so in the additional comment box, and we will mail you one as soon as they are available.

Thank you for your participation in our study. Your information and that of other anglers will help perpetuate our opportunities to enjoy Alaska through recreational fishing.

Doug Jones
Fisheries Biologist
Division of Sport Fish





GENERAL QUESTIONS



1. Did you stay at the cabin you reserved through the U.S. Forest Service?

☐ Yes ☐ No

If you answered YES, please go to question 2. If you answered NO, did someone else use your reservation?

☐ Yes ☐ No

This is all the information we need. Thank you, and please return this form in the enclosed envelope.

2. How many people stayed with you at the cabin? _____

3. Did you or anyone in your party (those people who stayed with you at the cabin) fish during your visit to the cabin?

☐ Yes ☐ No

If you answered YES, please go to Question 4. If you answered NO, you have come to the end of the questionnaire. Please return this form in the enclosed envelope. Thanks for your help.

4. If you fished for cutthroat trout during your stay at the cabin, please rate the overall quality of this experience:

☐ Poor ☐ Fair ☐ Good ☐ Excellent

5. Please complete the information on the backside of this form and return the form in the enclosed envelope.

Thanks for your assistance.

REMINDER LETTERS

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

DIVISION OF SPORT FISH

**TONY KNOWLES,
GOVERNOR**

P.O. Box 240020
Douglas, AK 99824
PHONE: (907) 465-4270
FAX: (907) 465-2034

Dear Recreational Cabin User:

Some time has passed since I first requested information about your fishing activities in (name of system). I still have not received your reply.

Even if you did not fish during your stay, your response to the general questions on the first page of the survey questionnaire are important. Please answer the questions that pertain to your trip and return the questionnaire in the enclosed postage-paid envelope.

Each questionnaire is significant to the outcome of our study. We are very interested in the amount of fishing pressure and the catch rates in this system. The information you provide will help enhance our understanding of the existing sport fishery by indicating relative fish abundance and condition of the fish population.

If you have already returned the questionnaire, please disregard this letter and accept my sincere thanks.

Sincerely,

Doug Jones

Fisheries Biologist
Alaska Dept. of Fish and Game
P.O. Box 240020
Douglas, Alaska 99824
Phone (907) 465-4310

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

DIVISION OF SPORT FISH

**TONY KNOWLES,
GOVERNOR**

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Douglas, AK 99824
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Dear Alaskan Angler

I have not yet received your completed cabin survey questionnaire. Even if you did not use the cabin or fish during your stay, your response to the general questions are important. Please complete the questionnaire and return it in the postage-paid envelope that is provided for your use. Your response will be considered confidential.

Please do not underestimate the importance of your fishing activities. The information you provide is vital to the success of this study, and may have significant impact on the future management of our sport fish resources.

If you have already returned your questionnaire, please disregard this letter and accept my sincere thanks.

Sincerely,

Doug Jones

Fisheries Biologist
Alaska Dept. of Fish and Game
P.O. Box 240020
Douglas, Alaska 99824